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(54) HEATABLE HAIR ROLLERS

(71) I, ARNE BYBJERG PEDERSEN, a Subject of the King of Denmark, of Hovvejen, Kalundborg, Denmark, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:

This invention relates to heatable hair hair rollers (or hair winders).

According to the invention there is provided a heatable hair roller having a temperature indicator which indicator comprises a complex compound of cuprous iodide and mercuric iodide suspended in a solid transparent carrier, the complex being capable of exhibiting a reversible colour change at a predetermined temperature.

The solid transparent carrier is preferably a solidified solution of a polymer or a copolymer, for example, polyvinylacetate or the copolymer derived from the copolymerisation of monochlorotrifluoroethylene and vinylidenefluoride.

As the result of the use of the above preferred carriers e.g. as descrbed in the Examples below, sublimation of the complex compound and consequent decomposition and loss of ability to change colour can be prevented, even at relatively high temperatures such as 120°C and the temperature of the roller may, therefore, vary from low to high temperature a large number of times without the intensity of the colour change being reduced. A further result obtained is an effective securing of the indicator to the roller on which it is placed, in that the indicator may be solidified into a conical hole having its smallest diameter near the surface of the roller.

In one embodiment of the temperature indicator used in the invention the solution consists of one part by weight of copolymer in one part by weight of methylethylketone.

In another embodiment the temperature indicator may be covered by a transparent film of plastics material for example, a polyester, and the film may have a thickness greater than or equal to 0.5 mm.

The use of a film provides additional security against sublimation since the complex compound, even after a considerable amount of time has passed, is unable to penetrate the film. The film also protects the indicator against mechanical wear.

A complex of cuprous iodide and mercuric iodide typically can provide a visual indication of a changing surface temperature within the range of 65-90°C by virtue of the fact that the complex is red when the temperature is below 65°C and black when the teperature is about 70°C.

Such complexes accordingly are particularly useful when applied to hair rollers or hair winders which prior to use are heated to a surface temperature of about 65°C. It will be appreciated that it is important that the colour change takes place within a relatively limited temperature range so that the user, by watching the change of colour from red to black, may ensure that the surface temperature of the winder is at least 65°C, which is the temperature required to make the curling effective within the time interval of treatment, for example, 10 to 15 minutes, determined by the thermal capacity of the roller.

It will be appreciated that if the roller is heated from within, for example, from a pin inserted into the interior of the roller and heated from a heating source such as an electric heating element, the temperature in the interior of the roller will generally be substantially higher than the temperature of the exterior of the roller, for example, 120°C. If so, the roller has to be so designed as to provide for a temperature drop from 120°C from the interior of the winder to about 65°C at its outer surface.

It will also be appreciated that as a

[Price 5s. 0d. (25p)]

further precaution against excessive heating of the hair winder, if the user should fail to notice the colour change, a heat-sensitive electric switch may be inserted, adjusted to cut off the current supply to the electric heating element when the said pin has reached a predetermined temperature, for example, 120°C.

Following is a description by way of example of temperature indicator compositions which can be applied to heatable hair rollers in accordance with the invention.

EXAMPLE I

1.0 g. of cuprous mercuric iodide is mixed with 1.0 g. of a 60 per cent by weight solution of polyvinylacetate 30 in ethyl acetate. After thorough mixing the temperature indicator is ready for use.

EXAMPLE II

1.0 g. of cuprous mercuric iodide is mixed with 1.0 g. of a 50 per cent by weight solution of monochlorotrifluoroethylene-vinylidenefluoride copolymer in 2-butanone. After thorough mixing the temperature indicator is ready for use.

WHAT I CLAIM IS:—

1. A heatable hair roller having a temperature indicator which indicator comprises a complex compound of cuprous iodide and mercuric iodide suspended in a solid transparent carrier, the complex being capable of exhibiting a reversible colour change at a predetermined temperature.

2. A heatable hair roller as claimed in claim 1, wherein the solid transparent carrier is a solidified solution of a polymer or co-polymer.

3. A heatable hair roller as claimed in claim 2, wherein the copolymer is derived from monochlorotrifluoroethylene and vinylidenefluoride.

4. A heatable hair roller as claimed in claim 2 or 3, wherein the solidified solution consists of one part by weight of copolymer in one part by weight of methylethylketone.

5. A heatable hair roller as claimed in any one of the preceding claims, wherein the complex compound which is suspended in a solid transparent carrier is covered by and sealed off from the ambient air by a transparent film of plastics material.

6. A heatable hair roller as claimed in claim 5, wherein the film has a thickness of at least 0.5 mm.

7. A heatable hair roller as claimed in claim 5 or 6, wherein the plastics material is a polyester.

8. A heatable hair roller as claimed in claim 1 wherein the temperature indicator is substantially as hereinbefore described in Example I or Example II.

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